

What is claimed is:

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1. A method of forming a conductor comprising:
depositing an insulator over a planarized surface;
etching a trench having a depth on the insulator;
depositing a barrier layer on the insulator;
depositing a seed layer on the barrier layer;
removing the barrier layer and seed layer from selected areas of the insulator,
leaving a seed area; and
10 depositing a conductor on the seed area by a selective deposition process.
2. The method of claim 1, wherein depositing the barrier layer on the insulator comprises:
depositing the barrier layer on the insulator by physical vapor-deposition.
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3. The method of claim 1, wherein etching a trench on the insulator comprises:
etching the trench to a depth of about equal to the depth of the insulator.
4. A method of forming a conductor comprising:
depositing an oxide layer over a planarized surface;
etching a trench on the oxide layer;
depositing a barrier layer on the oxide layer;
depositing a seed layer on the barrier layer;
removing the barrier layer and seed layer from unused areas of the oxide
layer, leaving a seed area; and
25 depositing a conductor on the seed area.

- (abn P)
5. The method of claim 4, wherein depositing an oxide layer over a planarized surface comprises:
depositing a silicon dioxide layer over the planarized surface.
- 5 6. The method of claim 4, wherein depositing an oxide layer over a planarized surface comprises:
depositing a fluorinated silicon oxide layer over the planarized surface.
- 10 7. The method of claim 4, wherein depositing a seed layer on the barrier layer comprises:
depositing the seed layer on the barrier layer by physical vapor-deposition.
- 15 8. A method of forming a conductor comprising:
depositing a polymer layer over a planarized surface;
etching a trench on the polymer layer;
depositing a barrier layer on the polymer layer;
depositing a seed layer on the polymer layer;
removing the seed layer from selected areas of the polymer layer, leaving a
seed area; and
20 depositing a conductor on the seed area.
- 25 9. The method of claim 8, wherein depositing a polymer layer over a planarized surface comprises:
depositing a polyimide layer over the planarized surface.
10. The method of claim 8, wherein depositing a polymer layer over a planarized surface comprises:
depositing a foamed polymer layer over the planarized surface.

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11. The method of claim 8, wherein depositing a seed layer on the polymer layer comprises:
depositing the seed layer on the polymer by physical vapor-deposition.
- 5 12. A method of forming a conductor comprising:
depositing an oxide layer over a planarized surface;
etching a trench on the oxide layer;
depositing a barrier layer tantalum on the oxide layer;
depositing a seed layer selected from the group consisting of gold, silver, and
10 copper on the oxide layer;
removing the barrier layer and seed layer from unused areas of the oxide
layer, leaving a seed area; and
depositing a conductor on the seed area.
- 15 13. The method of claim 12, wherein depositing a barrier layer tantalum on the
oxide layer comprises:
depositing the barrier layer to a depth of between fifty angstroms and one-
thousand angstroms.
- 20 14. The method of claim 12, wherein depositing the barrier layer of tantalum and
gold on the oxide layer comprises:
depositing the barrier layer by physical vapor-deposition.
- 25 15. A method of forming a conductor comprising:
depositing an oxide layer over a planarized surface;
etching a trench on the oxide layer;
depositing a barrier layer tantalum on the oxide layer;
depositing a seed layer of gold on the oxide layer;

- removing the barrier layer and seed layer from selected areas of the oxide
layer, leaving a seed area; and
depositing gold on the seed area.
- 5 16. The method of claim 15, wherein depositing a barrier layer tantalum on the
oxide layer comprises:
 depositing the barrier layer to a depth of between fifty angstroms and one-
 thousand angstroms.
- 10 17. The method of claim 15, wherein depositing the barrier layer of tantalum and
gold on the oxide layer comprises:
 depositing the barrier layer by physical vapor-deposition.
- 15 18. The method of claim 15, wherein depositing gold on the seed area comprises:
 depositing gold on the seed area by electroless plating.
- 20 19. A method of forming a conductor comprising:
 depositing an oxide layer over a planarized surface;
 etching a trench on the oxide layer;
 depositing a barrier layer selected from the group consisting of titanium,
 zirconium, and hafnium on the oxide layer;
 depositing a seed layer of silver on the oxide layer;
 removing the barrier layer and seed layer from selected areas of the oxide
 layer, leaving a seed area; and
 depositing silver on the seed area.
- 25 20. The method of claim 19, wherein depositing the barrier layer of titanium and
silver on the oxide layer comprises:

- depositing the barrier layer by physical vapor-deposition.
21. The method of claim 19, wherein depositing a seed layer of titanium and silver on the oxide layer comprises:
- 5 depositing the seed layer of titanium and silver to a depth of between fifty angstroms and two-thousand angstroms.
22. The method of claim 19, wherein depositing silver on the seed area comprises:
- 10 depositing silver on the seed area by electroless plating.
23. A method of forming a conductor comprising:
- depositing an oxide layer over a planarized surface;
- etching a trench on the oxide layer;
- 15 depositing a barrier layer selected from the group consisting of titanium, zirconium, and hafnium on the oxide layer;
- depositing a seed layer of copper on the oxide layer;
- removing the barrier layer and seed layer from selected areas or unused areas
- of the oxide layer, leaving a seed area; and
- 20 depositing aluminum on the seed area.
24. The method of claim 23, wherein depositing a barrier layer selected from the group consisting of titanium, zirconium, and hafnium on the oxide layer comprises:
- depositing the barrier layer to a depth of between fifty angstroms and one-
- 25 thousand angstroms.
25. The method of claim 23, wherein depositing the barrier layer of titanium and aluminum on the oxide layer comprises:

depositing the barrier layer by physical vapor-deposition.

26. The method of claim 23, wherein depositing copper on the seed area comprises:

5 depositing aluminum on the seed area by selective chemical vapor-deposition (CVD).

27. A method of forming a conductor comprising:

depositing a polymer layer over a planarized surface;

10 etching a trench on the polymer layer;

depositing a barrier layer selected from the group consisting of titanium,

zirconium, and hafnium on the polymer layer;

depositing a seed layer selected from the group consisting of gold, silver, and

copper on the polymer layer;

15 removing the barrier layer and seed layer from selected areas of the polymer layer, leaving a seed area; and

depositing a conductor on the seed area.

28. The method of claim 27, wherein depositing a barrier layer selected from the

20 group consisting of titanium, zirconium, and hafnium on the oxide layer comprises:

depositing the barrier layer to a depth of between fifty angstroms and one-thousand angstroms.

29. The method of claim 27, wherein depositing a barrier layer selected from the

25 group consisting of titanium, zirconium, and hafnium on the polymer layer

comprises:

depositing the barrier layer by physical vapor-deposition.

30. A method of forming a conductor comprising:
depositing a polymer layer over a planarized surface;
etching a trench on the polymer layer;
depositing a barrier layer selected from the group consisting of titanium,
zirconium, and hafnium on the polymer layer;
depositing a seed layer of gold on the polymer layer;
removing the barrier layer and seed layer from selected areas or unused areas
of the polymer layer, leaving a seed area; and
depositing gold on the seed area.

10 31. The method of claim 30, wherein depositing a barrier layer selected from the
group consisting of titanium, zirconium, and hafnium on the oxide layer comprises:
depositing the barrier layer to a depth of between fifty angstroms and one-
thousand angstroms.

15 32. The method of claim 30, wherein depositing a barrier layer selected form the
group consisting of titanium, zirconium, and hafnium on the oxide layer comprises:
depositing the barrier layer by physical vapor-deposition.

20 33. The method of claim 30, wherein depositing gold on the seed area comprises:
depositing gold on the seed area by electroless plating.

34. A method of forming a conductor comprising:
depositing a polymer layer over a planarized surface;
etching a trench on the polymer layer;
depositing a barrier layer selected from the group consisting of titanium,
zirconium, and hafnium on the polymer layer;
depositing a seed layer of silver on the polymer layer;

removing the barrier layer and seed layer from selected areas of the polymer layer, leaving a seed area; and
depositing silver on the seed area.

- 5 35. The method of claim 34, wherein depositing a barrier layer selected from the group consisting of titanium, zirconium, and hafnium on the oxide layer comprises:
 depositing the barrier layer to a depth of between fifty angstroms and one-thousand angstroms.
- 10 36. The method of claim 34, wherein depositing a barrier layer selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer comprises:
 depositing the barrier layer by physical vapor-deposition.
- 15 37. The method of claim 34, wherein depositing silver on the seed area comprises:
 depositing silver on the seed area by electroless plating.
- 20 38. A method of forming a conductor comprising:
 depositing a polymer layer over a planarized surface;
 etching a trench on the polymer layer;
 depositing a barrier layer selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer;
 depositing a seed layer of copper on the polymer layer;
 removing the barrier layer and seed layer from unused areas of the polymer layer, leaving a seed area; and
 depositing copper on the seed area.

39. The method of claim 38, wherein depositing a barrier layer selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer comprises:

5 depositing the barrier layer to a depth of between fifty angstroms and one-thousand angstroms.

40. The method of claim 38, wherein depositing a barrier layer selected from the group consisting of titanium, zirconium, and hafnium on the polymer layer comprises:

10 depositing the barrier layer by physical vapor-deposition.

41. The method of claim 38, wherein depositing copper on the seed area comprises:

15 depositing copper on the seed area by electroless plating.

~~42.~~ A method of forming a conductor comprising:

depositing an oxide layer over a planarized surface;

etching a trench on the oxide layer;

20 depositing a barrier layer selected from the group consisting of zirconium and titanium on the oxide layer;

depositing a seed layer of aluminum-copper on the oxide layer;

removing the barrier layer and seed layer from selected areas of the oxide layer, leaving a seed area; and

depositing a conductor on the seed area.

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43. The method of claim 42, wherein depositing a barrier layer selected from the group consisting of zirconium and titanium on the oxide layer comprises:

- depositing the barrier layer to a depth of between fifty angstroms and one-thousand angstroms.
44. The method of claim 42, wherein depositing the barrier layer selected from the group consisting of zirconium and titanium on the oxide layer comprises:
5 depositing the barrier layer by physical vapor-deposition.
45. A method of forming a conductor comprising:
10 depositing an oxide layer over a planarized surface;
etching a trench on the oxide layer;
depositing a barrier layer of zirconium on the oxide layer;
depositing a seed layer of aluminum-copper on the oxide layer;
removing the barrier layer and seed layer from selected areas of the oxide
15 layer, leaving a seed area; and
depositing aluminum on the seed area.
46. The method of claim 45, wherein depositing a barrier layer of zirconium on the oxide layer comprises:
20 depositing the barrier layer to a depth of between fifty angstroms and one-thousand angstroms.
47. The method of claim 45, wherein depositing a barrier layer of zirconium on the oxide layer comprises:
25 depositing the barrier layer by physical vapor-deposition.
48. The method of claim 45, wherein depositing aluminum on the seed area comprises:
depositing aluminum on the seed area by chemical vapor-deposition.

49. The method of claim 45, wherein depositing aluminum on the seed area comprises:

depositing an amount of aluminum sufficient to fill the trench.

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50. A method of forming a conductor comprising:
depositing an oxide layer over a planarized surface;
etching a trench on the oxide layer;
depositing a barrier layer of titanium on the oxide layer;
depositing a seed layer of aluminum-copper on the oxide layer;
removing the barrier layer and seed layer from selected areas or unused areas
of the oxide layer, leaving a seed area; and
depositing aluminum on the seed area.

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51. The method of claim 50, wherein depositing a barrier layer of titanium on the oxide layer comprises:
depositing the barrier layer to a depth of between fifty angstroms and one-thousand angstroms.

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52. The method of claim 50, wherein depositing a barrier layer of titanium on the oxide layer comprises:
depositing the barrier layer by physical vapor-deposition.

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53. The method of claim 50, wherein depositing aluminum on the seed area comprises:

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depositing aluminum on the seed area by chemical vapor-deposition.

54. The method of claim 50, wherein depositing a seed layer of titanium on the oxide layer comprises:

depositing the seed layer of titanium on the oxide layer by chemical vapor-deposition.

55. The method of claim 50, wherein depositing aluminum on the seed area
5 comprises:

depositing an amount of aluminum sufficient to fill the trench.

56. A method of forming a conductor comprising:

10 depositing an oxide layer over a planarized surface;
etching a trench having a top on the oxide layer;
depositing a barrier layer of tantalum nitride on the oxide layer;
depositing a seed layer of copper on the tantalum nitride layer;
removing the barrier layer and seed layer from selected areas of the oxide
15 layer;
depositing a conductor on the seed area leaving a seed area; and
depositing a layer of tantalum nitride above the conductor.

57. The method of claim 56, wherein depositing a barrier layer of tantalum
nitride on the oxide layer comprises:

20 depositing approximately one-hundred angstroms of tantalum nitride.

58. The method of claim 56, wherein depositing a seed layer of copper on the
tantalum nitride layer comprises:

25 depositing approximately five-hundred angstroms of copper on the tantalum
nitride layer.

59. The method of claim 56, wherein depositing a barrier layer of tantalum
nitride on the oxide layer comprises:

depositing the barrier layer of tantalum nitride by a non-anisotropic deposition technique.

60. The method of claim 56, wherein depositing a seed layer of copper on the
5 barrier layer of tantalum nitride comprises:

depositing the seed layer of copper on the tantalum nitride layer by a non-anisotropic deposition technique.

61. The method of claim 56, wherein depositing a barrier layer of tantalum
10 nitride on the oxide layer comprises:

depositing the barrier layer of tantalum nitride to a depth of between fifty angstroms and one-thousand angstroms.

62. The method of claim 56, wherein depositing a barrier layer of tantalum
15 nitride on the oxide layer comprises:

depositing the barrier layer of tantalum nitride on the oxide layer by chemical vapor-deposition.

63. The method of claim 56, wherein depositing a seed layer of copper on the
20 layer of tantalum nitride comprises:

depositing the seed layer copper on the barrier layer to a depth of approximately five-hundred angstroms below the top of the trench.

64. The method of claim 56, wherein depositing a barrier layer of tantalum
25 nitride above the conductor comprises:

depositing the barrier layer of tantalum nitride above the conductor to a depth of approximate five-hundred angstroms.

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65. The method of claim 56, wherein depositing an oxide layer over a planarized surface comprises:

depositing a silicon dioxide layer over the planarized surface.

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5 66. The method of claim 56, wherein depositing an oxide layer over a planarized surface comprises:

depositing a fluorinated silicon oxide layer over the planarized surface.

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67. A method of forming a conductor comprising:

depositing an oxide layer over a planarized surface;

etching a trench having a top on the oxide layer;

depositing a barrier layer of tantalum nitride on the oxide layer;

depositing a seed layer of copper on the oxide layer;

removing the barrier layer and seed layer from selected areas of the oxide

layer, leaving a seed area;

depositing a layer of copper on the seed area; and

depositing a layer of tantalum nitride above the layer of copper.

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20 68. The method of claim 67, wherein depositing a barrier layer of tantalum nitride on the oxide layer comprises:

depositing approximately one-hundred angstroms of tantalum nitride.

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69. The method of claim 67, wherein depositing a seed layer of copper on the oxide layer comprises:

25 depositing approximately five hundred angstroms of copper on the oxide layer.

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70. The method of claim 67, wherein depositing a barrier layer of tantalum nitride on the oxide layer comprises:
depositing the barrier layer of tantalum nitride by a non-anisotropic deposition technique.
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71. The method of claim 67, wherein depositing a barrier layer of tantalum nitride on the oxide layer comprises:
depositing the barrier layer of tantalum nitride to a depth of between fifty angstroms and one-thousand angstroms.
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72. The method of claim 67, wherein depositing a barrier layer of tantalum nitride on the oxide layer comprises:
depositing the barrier layer of tantalum nitride on the oxide layer by chemical vapor-deposition.
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73. The method of claim 67, wherein depositing a layer of copper on the seed area comprises:
depositing the layer of copper on the seed area by chemical vapor-deposition.
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74. The method of claim 67, wherein depositing a layer of copper on the seed area comprises:
depositing the layer of copper on the seed area to a depth of approximately five-hundred angstroms below the top of the trench.
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75. The method of claim 67, wherein depositing a layer of tantalum nitride above the copper comprises:
depositing the layer of tantalum nitride above the copper to a depth of approximate five-hundred angstroms.

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76. The method of claim 67, wherein depositing an oxide layer over a planarized surface comprises:
- depositing a silicon dioxide layer over the planarized surface.
- 5 77. The method of claim 67, wherein depositing an oxide layer over a planarized surface comprises:
- depositing a fluorinated silicon oxide layer over the planarized surface.
- 10 78. A connective structure comprising:
- an insulator above a planarized surface, the insulator having a trench, the trench having a trench surface;
- a barrier layer above the trench surface;
- a seed layer above the barrier layer; and
- a conductor above the seed layer.
- 15 79. The connective structure of claim 78, wherein the insulator has a depth, the trench has a depth and the depth of the trench is about equal to the depth of the insulator.
- 20 80. A connective structure comprising:
- an oxide layer above the planarized surface, the oxide layer having a trench, the trench having a trench surface;
- a barrier layer above the trench surface;
- a seed layer above the barrier layer; and
- a conductor above the seed layer.
- 25 81. The connective structure of claim 80, wherein the oxide layer is a silicon dioxide layer.

82. The connective structure of claim 80, wherein the oxide layer is a fluorinated silicon oxide layer.

5 83. A connective structure comprising:
 a polymer layer above the planarized surface, the polymer layer having a
 trench, the trench having a trench surface;
 a barrier layer above the trench surface;
 a seed layer above the barrier layer; and
10 a conductor above the seed layer.

84. The connective structure of claim 83, wherein the polymer layer is a polyimide layer.

15 85. The connective structure of claim 83, wherein the polymer layer is a foamed polymer layer.
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20 86. A connective structure comprising:
 an oxide layer above the planarized surface, the oxide layer having a trench,
 the trench having a trench surface;
 a barrier layer tantalum above the trench surface;
 a seed layer selected from the group consisting of gold, silver, and copper
 above the barrier layer; and
 a conductor above the seed layer.

25 87. The connective structure of claim 86, wherein the barrier layer has a depth of
 between fifty angstroms and one-thousand angstroms.

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88. A connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a trench,
the trench having a trench surface;
a barrier layer tantalum above the trench surface;
5 a seed layer of gold above the barrier layer; and
a gold layer above the seed layer.
89. The connective structure of claim 88, wherein the barrier layer has a depth of
between fifty angstroms and one-thousand angstroms.
- 10 90. A connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a trench,
the trench having a trench surface;
a barrier layer tantalum above the trench surface; and
15 a gold layer above the barrier layer.
- 20 91. A connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a trench,
the trench having a trench surface;
a barrier layer tantalum above the trench surface;
a seed layer of silver above the barrier layer; and
25 a silver layer above the barrier layer.
92. The connective structure of claim 91, wherein the barrier layer has a depth of
between fifty angstroms and one-thousand angstroms.
93. A connective structure comprising:

an oxide layer above the planarized surface, the oxide layer having a trench,
the trench having a trench surface;
a barrier layer tantalum above the trench surface; and
a silver layer above the barrier layer.

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94. A connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a trench,
the trench having a trench surface;
a barrier layer tantalum above the trench surface;
10 a seed layer of copper above the barrier layer; and
a copper layer above the seed layer.

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95. The connective structure of claim 94, wherein the barrier layer has a depth of
between fifty angstroms and one-thousand angstroms.

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96. A connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a trench,
the trench having a trench surface;
a barrier layer tantalum above the trench surface; and
20 a copper layer above the barrier layer.

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97. A connective structure comprising:
a polymer layer above a planarized surface, the polymer layer having a
trench, the trench having a trench surface;
25 a barrier layer selected from the group consisting of titanium, zirconium, and
hafnium above the trench surface;
a seed layer selected from the group consisting of gold, silver, and copper
above the barrier layer; and

a conductor layer above the seed layer.

98. The connective structure of claim 97, wherein the barrier layer has a depth of between fifty angstroms and one-thousand angstroms.

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~~99.~~ A connective structure comprising:

a polymer layer above a planarized surface, the polymer layer having a trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium, zirconium, and
10 hafnium above the trench surface;
a seed layer of gold above the barrier layer; and
a gold layer above the seed layer.

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15 100. The connective structure of claim 99, wherein the barrier layer has a depth of between fifty and one-thousand angstroms.

101. A connective structure comprising:

a polymer layer above a planarized surface, the polymer layer having a
trench, the trench having a trench surface;
20 a barrier layer selected from the group consisting of titanium, zirconium, and
hafnium above the trench surface; and
a gold layer above the barrier layer.

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~~102.~~ A connective structure comprising:

25 a polymer layer above a planarized surface, the polymer layer having a
trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium, zirconium, and
hafnium above the trench surface;

a seed layer of silver above the barrier layer; and
a silver layer above the seed layer.

103. The connective structure of claim 102, wherein the barrier layer has a depth
5 of between fifty angstroms and one-thousand angstroms.

104. A connective structure comprising:

10 a polymer layer above a planarized surface, the polymer layer having a
trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium, zirconium, and
hafnium above the trench surface; and
a silver layer above the barrier layer.

105. A connective structure comprising:

15 a polymer layer above a planarized surface, the polymer layer having a
trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium, zirconium, and
hafnium above the trench surface;
a seed layer of copper above the barrier layer; and
20 a copper layer above the seed layer.

106. The connective structure of claim 105, wherein the barrier layer has a depth
of between fifty angstroms and one-thousand angstroms.

25 107. A connective structure comprising:

a polymer layer above a planarized surface, the polymer layer having a
trench, the trench having a trench surface;

a barrier layer selected from the group consisting of titanium, zirconium, and hafnium above the trench surface;

a seed layer of copper above the barrier layer; and

a copper layer above the seed layer.

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108. A connective structure comprising:

an oxide layer above a planarized surface, the oxide layer having a trench, the trench having a trench surface;

a barrier layer selected from the group consisting of zirconium and titanium above the trench surface;

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a seed layer of aluminum-copper above the barrier layer; and

a conductor above the seed layer.

15 109. The connective structure of claim 108, wherein the barrier layer has a depth of between fifty angstroms and one-thousand angstroms.

110. A connective structure comprising:

an oxide layer above a planarized surface, the oxide layer having a trench, the trench having a trench surface;

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a barrier layer selected of zirconium above the trench surface;

a seed layer of aluminum-copper above the barrier layer; and

an aluminum layer above the seed layer.

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111. The connective structure of claim 110, wherein the barrier layer has a depth of between fifty and one-thousand angstroms.

112. The connective structure of claim 110, wherein the aluminum layer fills the trench.

113. A connective structure comprising:
an oxide layer above a planarized surface, the oxide layer having a trench, the
trench having a trench surface;
a barrier layer of titanium above the trench surface;
5 a seed layer of aluminum-copper above the barrier layer; and
an aluminum layer above the seed layer.
114. The connective structure of claim 113, wherein the barrier layer has a depth of
between fifty angstroms and one-thousand angstroms.
- 10 115. The connective structure of claim 113, where the aluminum layer fills the
trench.
116. A connective structure comprising:
15 an oxide layer above a planarized surface, the oxide layer having a trench, the
trench having a trench surface;
a barrier layer of tantalum nitride above the trench surface;
a seed layer of copper above the barrier layer;
an conductor layer above the seed layer; and
20 a tantalum nitride layer above the conductor layer.
117. The connective structure of claim 116, wherein the depth of the barrier layer
is approximately one-hundred angstroms.
- 25 118. The connective structure of claim 116, wherein the seed layer is
approximately five-hundred angstroms of copper.

119. The connective structure of claim 116, wherein the barrier layer is between fifty angstroms and one-thousand angstroms.
120. The connective structure of claim 116, wherein the trench has a top and the seed layer is approximately five-hundred angstroms below the top of the trench.
121. The connective structure of claim 116, wherein the barrier layer has a depth of approximately five-hundred angstroms.
122. The connective structure of claim 116, wherein the oxide layer is a silicon dioxide layer.
123. The connective structure of claim 116, wherein the oxide layer is a fluorinated silicon oxide layer.
124. A connective structure comprising:
an oxide layer above a planarized surface, the oxide layer having a trench, the trench having a trench surface;
a barrier layer of tantalum nitride above the trench surface;
a seed layer of copper above the barrier layer;
a copper layer above the seed layer; and
a tantalum nitride layer above the copper layer.
125. The connective structure of claim 124, wherein the barrier layer has a depth of approximately one-hundred angstroms.
126. The connective structure of claim 124, wherein the seed layer has a depth of approximately five-hundred angstroms.

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127. The connective structure of claim 124, wherein the barrier layer has a depth of between approximately fifty angstroms and one-thousand angstroms.
128. The connective structure of claim 124, wherein the trench has a top and the copper is approximately five-hundred angstroms below the top of the trench.
129. The connective structure of claim 124, wherein the tantalum nitride above the copper is deposited to a depth of approximately five-hundred angstroms.
- 10 130. The connective structure of claim 124, wherein the oxide layer is a silicon dioxide layer.
- 15 131. The connective structure of claim 124, wherein the oxide layer is a fluorinated silicon oxide layer.
132. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure
20 comprising:
an insulator above a planarized surface, the insulator having a trench,
the trench having a trench surface;
a barrier layer above the trench surface;
a seed layer above the barrier layer; and
25 a conductor above the seed layer.

133. The computer system of claim 132, wherein the insulator has a depth, the trench has a depth and the depth of the trench is about equal to the depth of the insulator.

5 134. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a
trench, the trench having a trench surface;
a barrier layer above the trench surface;
a seed layer above the barrier layer; and
a conductor above the seed layer.

15 135. The computer system of claim 134, wherein the oxide layer is a silicon dioxide layer.

20 136. The computer system of claim 134, wherein the oxide layer is a fluorinated silicon oxide layer.

25 137. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure comprising:
a polymer layer above the planarized surface, the polymer layer having a trench, the trench having a trench surface;

a barrier layer above the trench surface;
a seed layer above the barrier layer; and
a conductor above the seed layer.

5 138. The computer system of claim 137, wherein the polymer layer is a polyimide layer.

10 139. The computer system of claim 137, wherein the polymer layer is a foamed polymer layer.

140. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure

15 comprising:
an oxide layer above the planarized surface, the oxide layer having a trench, the trench having a trench surface;
a barrier layer tantalum above the trench surface;
a seed layer selected from the group consisting of gold, silver, and
20 copper above the barrier layer; and
a conductor above the seed layer.

25 141. The computer system of claim 140, wherein the barrier layer has a depth of between fifty angstroms and one-thousand angstroms.

142. A computer system comprising:
a processor;
a device coupled to the processor; and

a connective structure coupled to the device, the connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a
trench, the trench having a trench surface;
5 a barrier layer tantalum above the trench surface;
a seed layer of gold above the barrier layer; and
a gold layer above the seed layer.

143. The computer system of claim 142, wherein the barrier layer has a depth of
10 between fifty angstroms and one-thousand angstroms.

144. A computer system comprising:
a processor;
a device coupled to the processor; and
15 a connective structure coupled to the device, the connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a
trench, the trench having a trench surface;
a barrier layer tantalum above the trench surface; and
20 a gold layer above the barrier layer.

145. A computer system comprising:
a processor;
a device coupled to the processor; and
25 a connective structure coupled to the device, and the connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a
trench, the trench having a trench surface;

a barrier layer tantalum above the trench surface;
a seed layer of silver above the barrier layer; and
a silver layer above the barrier layer.

5 146. The computer system of claim 145, wherein the barrier layer has a depth of
between fifty angstroms and one-thousand angstroms.

~~147.~~ A computer system comprising:
a processor;
10 a device coupled to the processor; and
a connective structure coupled to the device, the connective structure
comprising:
an oxide layer above the planarized surface, the oxide layer having a
trench, the trench having a trench surface;
15 a barrier layer tantalum above the trench surface; and
a silver layer above the barrier layer.

~~148.~~ A computer system comprising:
a processor;
20 a device coupled to the processor; and
a connective structure coupled to the device, the connective structure
comprising:
an oxide layer above the planarized surface, the oxide layer having a
trench, the trench having a trench surface;
25 a barrier layer tantalum above the trench surface;
a seed layer of copper above the barrier layer; and
a copper layer above the seed layer.

149. The computer system of claim 148, wherein the barrier layer has a depth of between fifty angstroms and one-thousand angstroms.

150. A computer system comprising:

5 a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure comprising:
an oxide layer above the planarized surface, the oxide layer having a
10 trench, the trench having a trench surface;
a barrier layer tantalum above the trench surface; and
a copper layer above the barrier layer.

151. A computer system comprising:

15 a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure comprising:
a polymer layer above a planarized surface, the polymer layer having
20 a trench, the trench having a trench surface;
a barrier layer tantalum above the trench surface;
a seed layer selected from the group consisting of gold, silver, and
copper above the barrier layer; and
a conductor layer above the seed layer.

25 152. The computer system of claim 151, wherein the barrier layer has a depth of between fifty angstroms and one-thousand angstroms.

~~153.~~ A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure
comprising:
a polymer layer above a planarized surface, the polymer layer having
a trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium,
zirconium, and hafnium above the trench surface;
a seed layer of gold above the barrier layer; and
a gold layer above the seed layer.

154. The computer system of claim 153, wherein the barrier layer has a depth of
between fifty and one-thousand angstroms.

~~155.~~ A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, and the connective structure
comprising:
a polymer layer above a planarized surface, the polymer layer having
a trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium,
zirconium, and hafnium above the trench surface; and
a gold layer above the barrier layer.

~~156.~~ A computer system comprising:
a processor;

a device coupled to the processor; and
a connective structure coupled to the device, the connective structure comprising:
a polymer layer above a planarized surface, the polymer layer having
5 a trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium,
zirconium, and hafnium above the trench surface;
a seed layer of silver above the barrier layer; and
a silver layer above the seed layer.

10 157. The computer system of claim 156, wherein the barrier layer has a depth of between fifty angstroms and one-thousand angstroms.

15 158. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure comprising:
a polymer layer above a planarized surface, the polymer layer having
20 a trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium,
zirconium, and hafnium above the trench surface; and
a silver layer above the barrier layer.

25 159. A computer system comprising:
a processor;
a device coupled to the processor; and

a connective structure coupled to the device, the connective structure comprising:
a polymer layer above a planarized surface, the polymer layer having
a trench, the trench having a trench surface;
5 a barrier layer selected from the group consisting of titanium,
zirconium, and hafnium above the trench surface;
a seed layer of copper above the barrier layer; and
a copper layer above the seed layer.

10 160. The computer system of claim 159, wherein the barrier layer has a depth of
between fifty angstroms and one-thousand angstroms.

15 161. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure
comprising:
a polymer layer above a planarized surface, the polymer layer having
a trench, the trench having a trench surface;
a barrier layer selected from the group consisting of titanium,
zirconium, and hafnium above the trench surface;
a seed layer of copper above the barrier layer; and
a copper layer above the seed layer.

20 162. A computer system comprising:
a processor;
a device coupled to the processor; and

a connective structure coupled to the device, the connective structure comprising:
an oxide layer above a planarized surface, the oxide layer having a trench, the trench having a trench surface;
5 a barrier layer selected from the group consisting of zirconium and titanium above the trench surface;
a seed layer of aluminum-copper above the barrier layer; and
a conductor above the seed layer.

10 163. The computer system of claim 162, wherein the barrier layer has a depth of between fifty angstroms and one-thousand angstroms.

15 164. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, and the connective structure comprising:
an oxide layer above a planarized surface, the oxide layer having a trench, the trench having a trench surface;
20 a barrier layer selected of zirconium above the trench surface;
a seed layer of aluminum-copper above the barrier layer; and
an aluminum layer above the seed layer.

25 165. The computer system of claim 164, wherein the barrier layer has a depth of between fifty and one-thousand angstroms.

166. The computer system of claim 164, wherein the aluminum layer fills the trench.

167. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure
comprising:
an oxide layer above a planarized surface, the oxide layer having a
trench, the trench having a trench surface;
a barrier layer of titanium above the trench surface;
a seed layer of aluminum-copper above the barrier layer; and
an aluminum layer above the seed layer.

168. The computer system of claim 167, wherein the barrier layer has a depth of
between fifty angstroms and one-thousand angstroms.

169. The computer system of claim 167, where the aluminum layer fills the trench.

170. A computer system comprising:
a processor;
a device coupled to the processor; and
a connective structure coupled to the device, the connective structure
comprising:
an oxide layer above a planarized surface, the oxide layer having a
trench, the trench having a trench surface;
a barrier layer of tantalum nitride above the trench surface;
a seed layer of copper above the barrier layer;
an conductor layer above the seed layer; and
a tantalum nitride layer above the conductor layer.

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171. The computer system of claim 170, wherein the depth of the barrier layer is approximately one-hundred angstroms.
172. The computer system of claim 170, wherein the seed layer is approximately five-hundred angstroms of copper.
173. The computer system of claim 170, wherein the barrier layer is between fifty angstroms and one-thousand angstroms.
174. The computer system of claim 170, wherein the trench has a top and the seed layer is approximately five-hundred angstroms below the top of the trench.
175. The computer system of claim 170, wherein the barrier layer has a depth of approximately five-hundred angstroms.
176. The computer system of claim 170, wherein the oxide layer is a silicon dioxide layer.
177. The computer system of claim 170, wherein the oxide layer is a fluorinated silicon oxide layer.
178. A computer system comprising:
- a processor;
- a device coupled to the processor; and
- a connective structure coupled to the device, the connective structure comprising:
- an oxide layer above a planarized surface, the oxide layer having a trench, the trench having a trench surface;

a barrier layer of tantalum nitride above the trench surface;
a seed layer of copper above the barrier layer;
a copper layer above the seed layer; and
a tantalum nitride layer above the copper layer.

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179. The computer system of claim 178, wherein the barrier layer has a depth of approximately one-hundred angstroms.

180. The computer system of claim 178, wherein the seed layer has a depth of

10 approximately five-hundred angstroms.

181. The computer system of claim 178, wherein the barrier layer has a depth of between approximately fifty angstroms and one-thousand angstroms.

15 182. The computer system of claim 178, wherein the trench has a top and the copper is approximately five-hundred angstroms below the top of the trench.

183. The computer system of claim 178, wherein the tantalum nitride above the copper is deposited to a depth of approximately five-hundred angstroms.

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184. The computer system of claim 178, wherein the oxide layer is a silicon dioxide layer.

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185. The computer system of claim 178, wherein the oxide layer is a fluorinated silicon oxide layer.